



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-------------------------|------------------------|
| 10/779,446 | 02/13/2004 | Hoon Kim | 5000-1-522 | 8979 |
| 33942 | 7590 | 06/15/2007 | | |
| CHA & REITER, LLC 210 ROUTE 4 EAST STE 103 PARAMUS, NJ 07652 | | | EXAMINER LI, SHI K | |
| | | | ART UNIT 2613 | PAPER NUMBER |
| | | | MAIL DATE 06/15/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

5/

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/779,446 | KIM ET AL. | |
| | Examiner | Art Unit | |
| | Shi K. Li | 2613 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species I, claims 1-7 and 10-14, in the reply filed on 29 March 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 8 and 9 have been withdrawn from consideration.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2. Claim 12-13 are objected to because of the following informalities: In claim 12, line 2, "turbo cord" should read "turbo code"; in claim 13, line 2, "LDPC cord" should read "LDPC code". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admission (admitted prior art) in view of Kamalov et al. (U.S. Patent 7,149,424 B2).

Regarding claims 1 and 14, Admission (FIG. 1 – prior art) teaches a passive optical network comprising a plurality of optical network units 100, each unit having an assigned code (PN codes 1 through N) and a central office 200. The difference between Admission and the claimed invention is that Admission does not teach using error correction codes. Kamalov et al.

Art Unit: 2613

teaches in FIG. 1 a passive optical network. Kamalov et al. teaches in FIG. 2 to use forward error correction (FEC) codes for transmission such that the receiving end can use the FEC for determining bit-error rate and feedback the bit error rate to the transmitting end for adjusting signal parameters such as signal wavelength. One of ordinary skill in the art would have been motivated to combine the teaching of Kamalov et al. with the passive optical system of Admission because using FEC and bit-error rate feedback improves transmission quality and is inexpensive. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use FEC and bit-error rate feedback for improving transmission quality, as taught by Kamalov et al., in the passive optical system of Admission because the method is inexpensive.

Regarding claim 2, Admission teaches a code division multiple access (CDMA) optical network.

Regarding claim 3, Kamalov et al. teaches adjusting signal wavelength based on bit error rate.

Regarding claim 4, Admission teaches pseudo-noise (PN) code.

Regarding claim 5, Admission teaches upstream and downstream signals.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admission and Kamalov et al. as applied to claims 1-5 and 14 above, and further in view of Ahn et al. (B. Ahn et al., "A Symmetric-Structure CDMA-PON System and Its Implementation", IEEE Photonics Technology Letters, Vol. 14, No. 9, September 2002).

Admission and Kamalov et al. have been discussed above in regard to claims 1-5 and 14. The difference between Admission and Kamalov et al. and the claimed invention is that

Art Unit: 2613

Admission and Kamalov et al. do not teach multiplexer for combining error count and data. However, it is well known in the art that many signal streams can be combined using multiplexing techniques. For example, Ahn et al. teaches in FIG. 1 a CDMA-PON system. Ahn et al. teaches in FIG. 4 multiplexing scheme for feeding back information from the receiver to the transmitter for adjusting transmitter parameter. One of ordinary skill in the art would have been motivated to combine the teaching of Ahn et al. with the modified passive optical network of Admission and Kamalov et al. because using multiplexing technique eliminates the need for a dedicated communication link for feedback and especially suitable for bi-directional communication systems. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to multiplex feedback information with data signal using a multiplex, as taught by Ahn et al., in the modified passive optical network of Admission and Kamalov et al. because using multiplexing technique eliminates the need for a dedicated communication link for feedback and especially suitable for bi-directional communication systems.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admission, Kamalov et al. and Ahn et al. as applied to claim 6 above, and further in view of DeCusatis et al. (U.S. Patent 7,061,944 B2).

Admission, Kamalov et al. and Ahn et al. have been discussed above in regard to claim 6. The difference between Admission, Kamalov et al. and Ahn et al. and the claimed invention is that Admission, Kamalov et al. and Ahn et al. do not teach a bias controller for adjusting wavelength. DeCusatis et al. teaches in FIG. 1(b) a circuit for adjusting wavelength of laser diode 12 by adjusting the bias voltage 14. One of ordinary skill in the art would have been

Art Unit: 2613

motivated to combine the teaching of DeCusatis et al. with the modified passive optical network of Admission, Kamalov et al. and Ahn et al. because controlling bias is a simple method comparing with other wavelength control method such as adjusting temperature (see FIG. 11 of DeCusatis et al.). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust wavelength by using a bias voltage controller, as taught by DeCusatis et al., in the modified passive optical network of Admission, Kamalov et al. and Ahn et al. because controlling bias is a simple method. The Examiner also recognizes that whether using bias controller or other method to adjust wavelength is merely amount to selection of expedients known to an artisan of ordinary skill as design choices.

7. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admission and Kamalov et al. as applied to claims 1-5 and 14 above, and further in view of Argon et al. (U.S. Patent 6,847,760 B2).

Admission and Kamalov et al. have been discussed above in regard to claims 1-5 and 14. The difference between Admission and Kamalov et al. and the claimed invention is that Admission and Kamalov et al. do not teach the particular coding scheme. Argon et al. teaches in col. 3, lines 62-67 that Reed-Solomon code, BCH code, LDPC code and turbo codes are well known FEC coding formats. The Examiner recognizes that it is obvious for one of ordinary skill in the art at the time the invention was made to choose any one of these coding formats as a design choice.

Conclusion

Art Unit: 2613

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (7:30 a.m. - 4:30 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

skl
10 June 2007



Shi K. Li
Patent Examiner